

Document made available under the Patent Cooperation Treaty (PCT)

International application number: PCT/US04/020016

International filing date: 23 June 2004 (23.06.2004)

Document type: Certified copy of priority document

Document details: Country/Office: US
Number: 60/480,977
Filing date: 23 June 2003 (23.06.2003)

Date of receipt at the International Bureau: 19 August 2004 (19.08.2004)

Remark: Priority document submitted or transmitted to the International Bureau in compliance with Rule 17.1(a) or (b)



BEST AVAILABLE COPY

World Intellectual Property Organization (WIPO) - Geneva, Switzerland
Organisation Mondiale de la Propriété Intellectuelle (OMPI) - Genève, Suisse

1210115

THE UNITED STATES OF AMERICA

TO ALL TO WHOM THESE PRESENTS SHALL COME;

UNITED STATES DEPARTMENT OF COMMERCE

United States Patent and Trademark Office

August 11, 2004

THIS IS TO CERTIFY THAT ANNEXED HERETO IS A TRUE COPY FROM THE RECORDS OF THE UNITED STATES PATENT AND TRADEMARK OFFICE OF THOSE PAPERS OF THE BELOW IDENTIFIED PATENT APPLICATION THAT MET THE REQUIREMENTS TO BE GRANTED A FILING DATE.

APPLICATION NUMBER: 60/480,977

FILING DATE: June 23, 2003


RELATED PCT APPLICATION NUMBER: PCT/US04/20016

Certified by



Jon W Dudas

Acting Under Secretary of Commerce
for Intellectual Property
and Acting Director of the U.S.
Patent and Trademark Office


Please type a plus sign (+) inside this box 

Approved for use through 4/30/2003. OMB 0651-0032
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

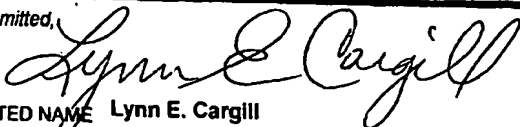
PROVISIONAL APPLICATION FOR PATENT COVER SHEET

This is a request for filing a PROVISIONAL APPLICATION FOR PATENT under 37 CFR 1.53(c).

INVENTOR(S)					
Given Name (first and middle (if any))		Family Name or Surname		Residence (City and either State or Foreign Country)	
Steven G.		Smarsch		Clinton Township; Michigan	
<input type="checkbox"/> Additional inventors are being named on the _____ separately numbered sheets attached hereto					
TITLE OF THE INVENTION (280 characters max) NON-GLAZING DRESSING WHEEL					
Direct all correspondence to: CORRESPONDENCE ADDRESS					
<input checked="" type="checkbox"/> Customer Number		25686			
OR		Type Customer Number here			
<input type="checkbox"/> Firm or Individual Name		25686 PATENT TRADEMARK OFFICE			
Address					
Address					
City		State		ZIP	
Country		Telephone		Fax	
ENCLOSED APPLICATION PARTS (check all that apply)					
<input checked="" type="checkbox"/> Specification Number of Pages		6		<input type="checkbox"/> CD(s), Number	
<input checked="" type="checkbox"/> Drawing(s) Number of Sheets		5		<input type="checkbox"/> Other (specify)	
<input type="checkbox"/> Application Data Sheet. See 37 CFR 1.76					
METHOD OF PAYMENT OF FILING FEES FOR THIS PROVISIONAL APPLICATION FOR PATENT (check one)					
<input checked="" type="checkbox"/> Applicant claims small entity status. See 37 CFR 1.27.				FILING FEE AMOUNT (\$)	
<input checked="" type="checkbox"/> A check or money order is enclosed to cover the filing fees					
<input checked="" type="checkbox"/> The Director is hereby authorized to charge filing fees or credit any overpayment to Deposit Account Number		03-0682		\$80.00	
<input type="checkbox"/> Payment by credit card. Form PTO-2038 is attached.					
The invention was made by an agency of the United States Government or under a contract with an agency of the United States Government.					
<input checked="" type="checkbox"/> No.					
<input type="checkbox"/> Yes, the name of the U.S. Government agency and the Government contract number are: _____					

Respectfully submitted,

SIGNATURE



TYPED or PRINTED NAME Lynn E. Cargill

TELEPHONE 586-465-6600

Date 6-23-03

REGISTRATION NO.

31,598

(if appropriate)

Docket Number:

TruTech A-319

USE ONLY FOR FILING A PROVISIONAL APPLICATION FOR PATENT

This collection of information is required by 37 CFR 1.51. The information is used by the public to file (and by the PTO to process) a provisional application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 8 hours to complete, including gathering, preparing, and submitting the complete provisional application to the PTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Mail Stop Provisional Application, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.

P1MALL/REV05



Attorney Docket: TruTech A-319

Patent

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:

Serial No.: Filed Herewith

Filing Date: June 23, 2003

Title: "NON-GLAZING DRESSING WHEEL"

Mail Stop Provisional Patent Application
Commissioner for Patents
PO Box 1450
Alexandria VA 22313-1450

TRANSMITTAL LETTER

Dear Sir:

Enclosed herewith for filing in the above-identified provisional patent application, please find the following documents:

1. Transmittal Letter (original & copy) - 2 Pgs.;
2. Provisional Application For Patent Cover Sheet - 1 Pg.;
3. Application For Letters Patent (Specification) - 6 Pgs.;
4. Drawings - 5 Pgs.;
5. Check No.5207 for \$80.00 Filing Fee; and
6. Return Receipt Postcard

EXPRESS MAIL CERTIFICATE

"Express Mail" Label Number: EU290311361US

Date of Deposit: June 23, 2003

I hereby certify that the following attached papers and/or fee are being deposited with the United States Postal Service "Express Mail Post Office to Addressee" service under 37 CFR 1.10, with sufficient postage, on the date indicated above and is addressed to "Mail Stop Provisional Patent Application, Commissioner for Patents, PO Box 1450, Alexandria, VA 22313-1450".

Cynthia A. Ludeman

Name

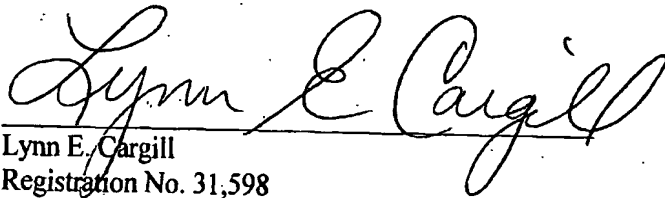
Signature

Transmittal Letter
June 23, 2003
Page 2

The Commissioner is authorized to charge any underpayment in fees not covered in Check No 5207 and/or credit any overpayment made in Check No. 5207 associated with this communication to Deposit Account No. 03-0682. A duplicate copy of this Transmittal is enclosed.

Respectfully submitted,

CARGILL & ASSOCIATES, P.L.L.C.

A handwritten signature in cursive script, reading "Lynn E. Cargill", written over a horizontal line.

Lynn E. Cargill
Registration No. 31,598
56 Macomb Place
Mt. Clemens MI 48043-5636
(586) 465-6600

Date: June 23, 2003

C:\TrnTech\A-3197\Trans062303

APPLICATION FOR LETTERS PATENT

for

*NON-GLAZING
DRESSING WHEEL*

by

Steven G. Smarsh
38854 Parkview Drive
Clinton Township MI 48036

a Citizen of the United States of America

NON-GLAZING DRESSING WHEEL

BACKGROUND OF THE INVENTION

5

In the centerless grinding industry, dressing wheels are conventionally used in order to true up the grinding wheel between jobs in order to maintain a high tolerance of accuracy in the grinding operations. In the course of using the dressing wheel to true up the grinding wheel, the dressing wheel can glaze the surface of the grinding wheel or it may cause heat expansion on the surface of the grinding wheel, and therefore destroys the effectiveness of the grinding wheel on later jobs. Other problems may also occur besides those mentioned. When heat expansion occurs, the grinding wheel then comes out of tolerance, and is incapable of accurately performing the grinding operation in the manner which is desired. As grinding operations become more and more precise, the dressing wheel becomes increasingly important to keep the grinding wheel in near perfection so that the subsequent work pieces are as close as possible to perfection.

Although the invention will be described by way of examples hereinbelow for specific embodiments having certain features, it must also be realized that minor modifications that do not require undo experimentation on the part of the practitioner are covered within the scope and breadth of this invention. Additional advantages and other novel features of the present invention will be set forth in the description that follows and in particular will be apparent to those skilled in the art upon examination or may be learned within the practice of the invention. Therefore, the invention is capable of many other different embodiments and its details are capable of modifications of various aspects which will be obvious to those of ordinary skill in the art all without departing from the spirit of the present invention. Accordingly, the rest of the description will be regarded as illustrative rather than restrictive.

30

DETAILED DESCRIPTION OF THE INVENTION

The present invention achieves the above described advantages and objectives because it involves a new configuration of a dressing wheel, made in accordance with the present invention, which involves interrupted cutting of the grinding wheel, thereby alleviating or eliminating glazing and/or heat expansion of the grinding wheel being dressed. The dressing wheel may be made of a single or multiple sandwich concept, in which at least one material having a dressing wheel characteristic is utilized for the outer components of the sandwiched dressing wheel, as described more fully hereinbelow.

The present invention provides a non-glazing and non-heat expanding dressing wheel for dressing grinding wheels that is especially useful in centerless grinding and other applications. In the preferred embodiment, a surface having an interrupted cutting surface is disclosed which includes a star-shaped stainless steel cutting star which is sandwiched between two dressing wheel materials. The star may be made of stainless steel of any grade, cold rolled steel, copper, brass, or any other suitable metal. In addition, there may be more than one of the star-shaped dressing wheel components, but multiple star-shaped components may be utilized and sandwiched between various ceramic dressing wheel materials, or may be sandwiched next to each other in the middle of the dressing wheel. The star-shaped non-glazing dressing stone component also generally will include a central orifice for attachment to a spindle on the center less grinding machine.

Generally, the extent of the star-shaped or saw-blade-shaped dressing wheel component for interrupted cutting will be of an even diameter with the rest of the dressing wheel ceramic components, or may be slightly smaller in diameter in order to prevent ripping of the grinding wheel, rather than just interrupted cutting of the grinding wheel. Although it is reasoned that the interrupted cut component of the dressing wheel should be even with or smaller than the diameter of the dressing wheel, it is possible that for certain applications, the star-shaped component should be of a slightly greater diameter than the borazon, diamond, or ceramic dressing wheel component.

In addition, and in another embodiment, various other star-shaped components may also be made like a circular saw blade. This embodiment may include hardened tips, such that the bulk of the saw blade component may be made of almost any material, as long as the tips are hardened to effect interrupted cutting, thereby preventing glazing and or heat expansion of the grinding wheel be dressed. Further, the star-shaped component or the saw-blade component may also be made itself of a sandwiched material as would be known in the metallurgical art, and may be incorporated into the present invention without undo experimentation. The saw-blade configuration may also take the shape of the saw-blade configuration of FIG. 18 of U.S. Patent Application No. 09/720,576, filing date of December 22, 2000, which is incorporated herein by reference.

Looking now to the drawings, we first look at FIG. 1A, where a star-shaped dressing wheel component has been taken out of the dressing wheel of the present invention, and is generally shown and referred to by numeral 10. Star-shaped component 10 includes star tips 12, and has a central orifice 14 therethrough in order to allow for mounting onto a spindle assembly which is utilized to rotate the dressing wheel. The remaining components are shown in subsequent drawings.

FIG. 1B illustrates another embodiment of the interrupting cut portion of the present invention, i.e. one that looks like the saw blade of a circular saw, and is also generally denoted by numeral 10. The interrupted cutting surfaces, or star tips 12, are shown having hardened tips 16. Again, central orifice 14 extends therethrough for mounting on a spindle assembly, while the bulk of the star-shaped component 10 may be made of any suitable material, so long as the tips are hardened as shown as tips 16. As discussed hereinabove, different configurations of the materials and interrupted cutting surfaces of the star-shaped component 10 may be utilized, without undo experimentation, so long as it achieves the objectives of the present invention, i.e. to prevent or alleviate glazing and/or heat expansion of a wheel being dressed. The great number of possibilities of the configurations of the tips for the star-shaped component 10 are too numerous to list here, or to even show here, but all of them may be utilized, and are within the scope of the present invention. Again, so long as interrupted cutting is effected by the dressing wheel, the star-shaped component 10 will have achieved its purpose.

FIG 2A illustrates the preferred embodiment of the present invention, including a multi-layer sandwiched dressing wheel generally denoted by the numeral 20. Within multi-layer dressing wheel 20, there is a first dressing wheel component 22 and a second dressing wheel component 24 located on either side of the star-shaped component (only the tips are shown), but showing the star-shaped tips 26 extending to the outer diameter of both of the first and second dressing wheel components 22 and 24, respectively. Although the first and second dressing wheel components 22 and 24 may be made of any suitable material, such as diamond, or borazon, the present invention envisions the use of any suitable hard material including any suitable ceramic, including silicon carbide, silicon nitride, silicon oxynitride, silicon carbonitride, boron carbide, tungsten carbide, titanium carbide, or combinations of those ceramics, or any other suitable ceramic, including aluminum oxide, aluminum nitride, aluminum carbide, or any of the other super hard ceramics. In the present invention, the preferred embodiment includes the use of a silicon carbide material for the first dressing wheel component, while aluminum oxide is used for the second dressing wheel component.

FIG. 2B is a side elevational view of the dressing wheel sandwich 20 in accordance with the present invention, illustrating the relative placement of the first dressing wheel component 22 and the second dressing wheel component 24, with sandwiching the star-shaped interrupted cutting component 26. Star-shaped component 26 extends to the diameter of the other dressing wheel components 22 and 24, and may be of the same diameter, a smaller diameter, or a slightly larger diameter.

FIG. 2C illustrates yet another embodiment including a multi-layer dressing wheel 30 having more than one star-shaped component sandwiched therein. Multi-layer dressing wheel 30 will include at least a first dressing wheel component 32, a second dressing wheel component 34, and a third dressing wheel component 36. Sandwiched therebetween will be a first star-shaped component 38, and a second star-shaped component 40.

The foregoing description of a preferred embodiment of the invention has been presented for purposes of illustration and description. It is not intended to be to be exhaustive or to limit the invention to the precise form disclosed. Obvious modifications or variations are possible in light of the above teachings with regards to the specific embodiments. The
5 embodiment was chosen and described in order to best illustrate the principles of the invention and its practical applications to thereby enable one of ordinary skill in the art to best utilize the invention in various embodiments and with various modifications as are suited to the particular use contemplated.

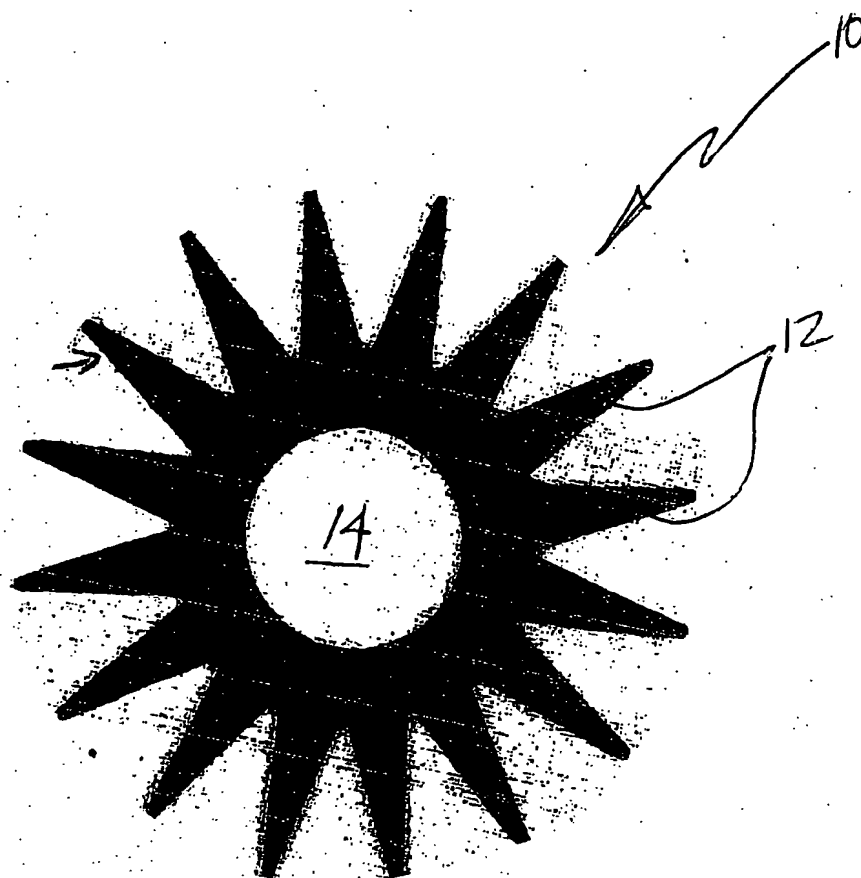


FIG 1A

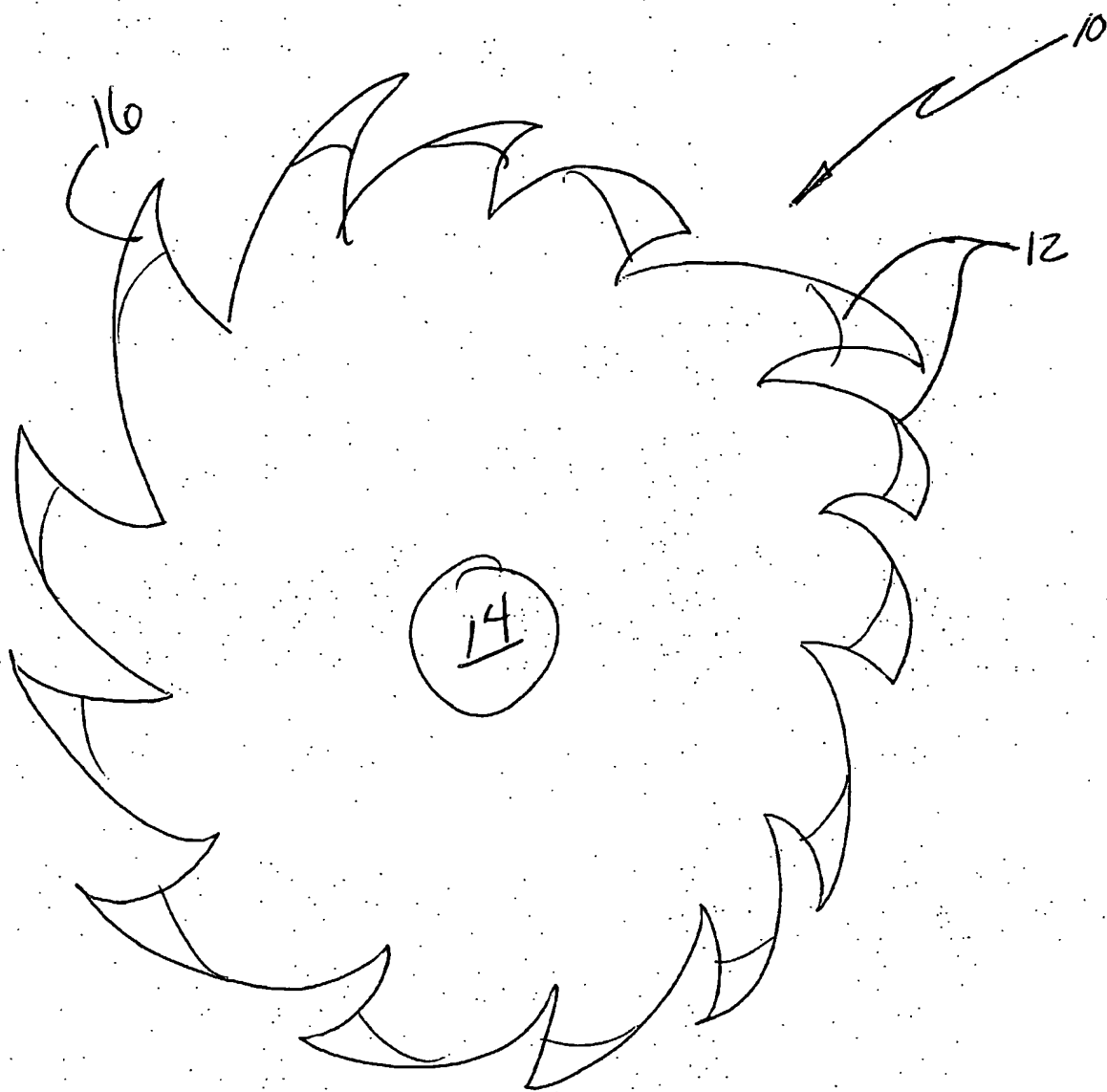


Fig 1 B

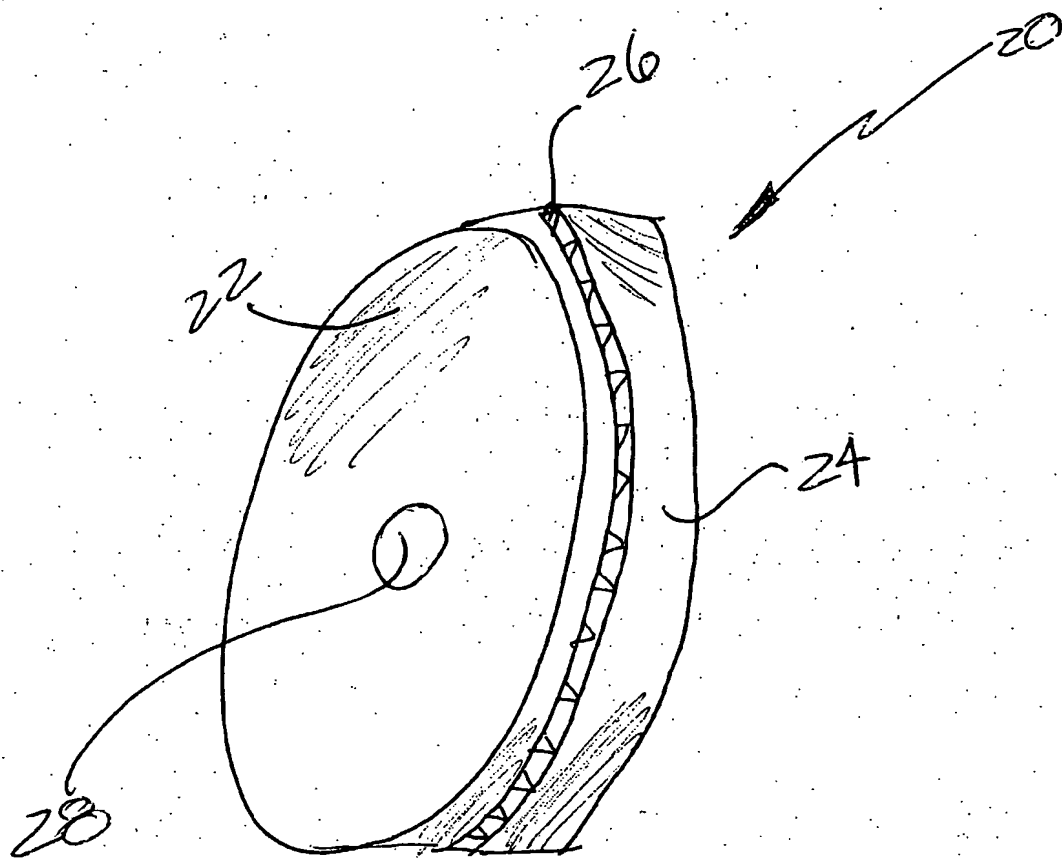


FIG. 2A

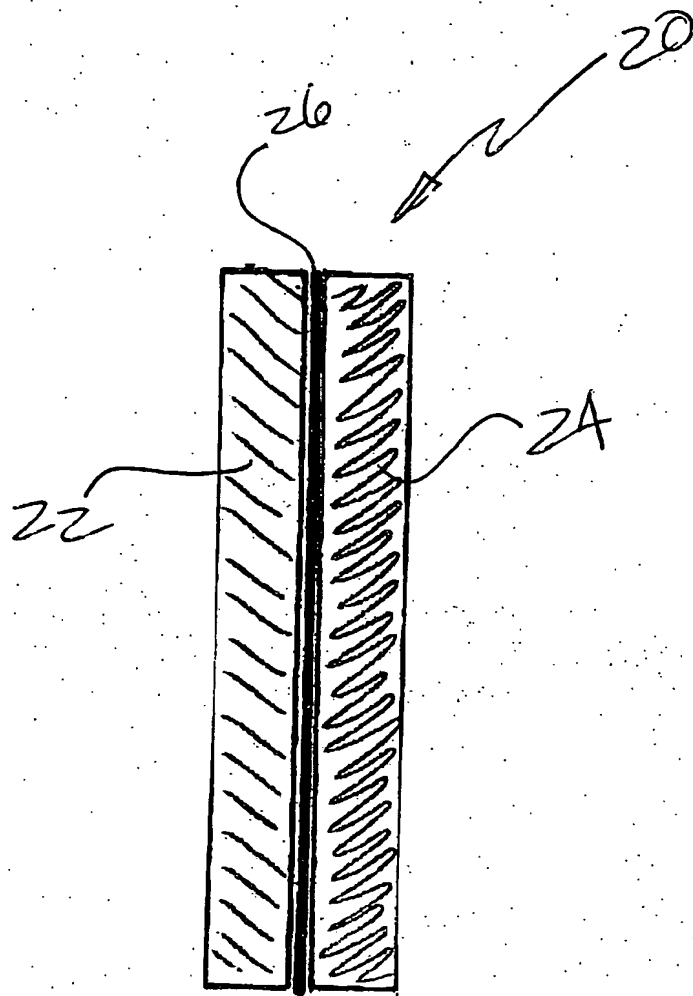


FIG 2B

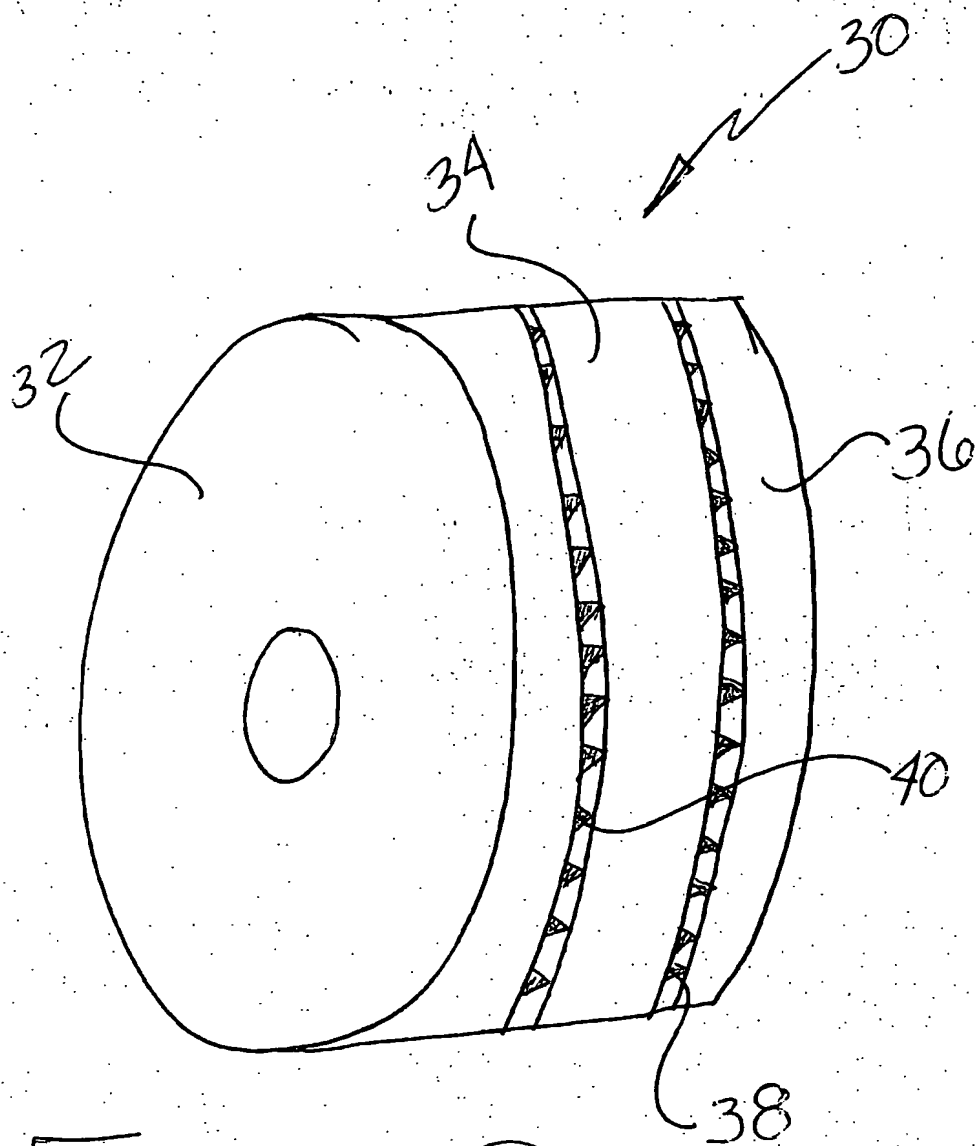


FIG 2C

**This Page is Inserted by IFW Indexing and Scanning
Operations and is not part of the Official Record**

BEST AVAILABLE IMAGES

Defective images within this document are accurate representations of the original documents submitted by the applicant.

Defects in the images include but are not limited to the items checked:

- ☒ **BLACK BORDERS**
- ☐ **IMAGE CUT OFF AT TOP, BOTTOM OR SIDES**
- ☒ **FADED TEXT OR DRAWING**
- ☒ **BLURRED OR ILLEGIBLE TEXT OR DRAWING**
- ☐ **SKEWED/SLANTED IMAGES**
- ☐ **COLOR OR BLACK AND WHITE PHOTOGRAPHS**
- ☐ **GRAY SCALE DOCUMENTS**
- ☐ **LINES OR MARKS ON ORIGINAL DOCUMENT**
- ☐ **REFERENCE(S) OR EXHIBIT(S) SUBMITTED ARE POOR QUALITY**
- ☐ **OTHER:** _____

IMAGES ARE BEST AVAILABLE COPY.

As rescanning these documents will not correct the image problems checked, please do not report these problems to the IFW Image Problem Mailbox.